

FIG. 1

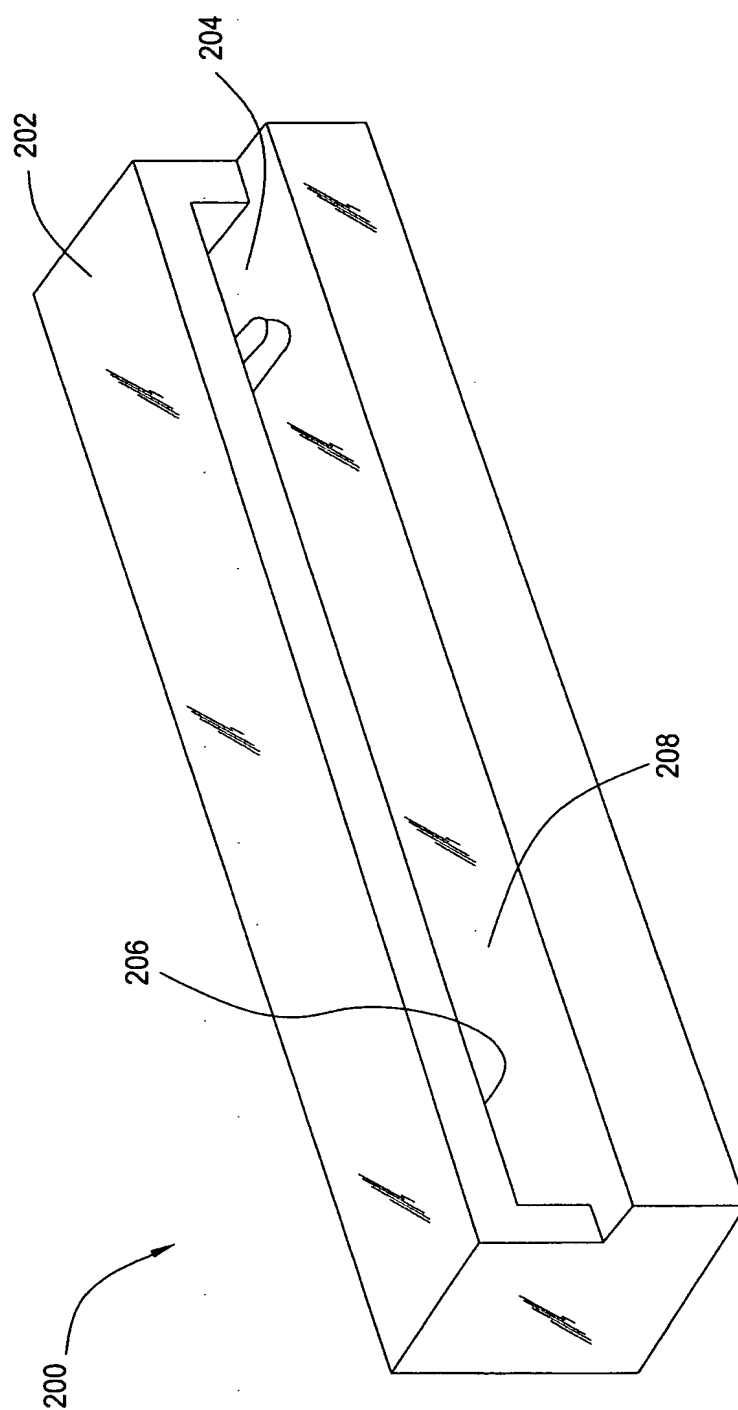


FIG. 2

Pin#	Signal Name	Pin#	Signal Name
1	PWR_SRC	2	SVRUN
3	PWR_SRC	4	RUNPWROK#
5	PWR_SRC	6	1V8RUN
7	PWR_SRC	8	1V8RUN
9	PWR_SRC	10	1V8RUN
11	PWR_SRC	12	1V8RUN
13	PWR_SRC	14	1V8RUN
15	PWR_SRC	16	1V8RUN
17	GND	18	1V8RUN
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	KEY	26	KEY
27	KEY	28	KEY
29	KEY	30	KEY
31	KEY	32	KEY
33	KEY	34	KEY
35	KEY	36	KEY
37	PEX_RX15#	38	PRSNT2#
39	PEX_RX15	40	PEX_TX15#
41	GND	42	PEX_TX15
43	PEX_RX14#	44	GND
45	PEX_RX14	46	PEX_TX14#
47	GND	48	PEX_TX14
49	PEX_RX13#	50	GND
51	PEX_RX13	52	PEX_TX13#
53	GND	54	PEX_TX13
55	PEX_RX12#	56	GND
57	PEX_RX12	58	PEX_TX12#
59	GND	60	PEX_TX12
61	PEX_RX11#	62	GND
63	PEX_RX11	64	PEX_TX11#
65	GND	66	PEX_TX11
67	PEX_RX10#	68	GND
69	PEX_RX10	70	PEX_TX10#
71	GND	72	PEX_TX10
73	PEX_RX9#	74	GND
75	PEX_RX9	76	PEX_TX9#
77	GND	78	PEX_TX9
79	PEX_RX8#	80	GND
81	PEX_RX8	82	PEX_TX8#
83	GND	84	PEX_TX8
85	PEX_RX7#	86	GND

Pin#	Signal Name	Pin#	Signal Name
87	PEX_RX7	88	PEX_TX7#
89	GND	90	PEX_TX7
91	PEX_RX6#	92	GND
93	PEX_RX6	94	PEX_TX6#
95	GND	96	PEX_TX6
97	PEX_RX5#	98	GND
99	PEX_RX5	100	PEX_TX5#
101	GND	102	PEX_TX5
103	PEX_RX4#	104	GND
105	PEX_RX4	106	PEX_TX4#
107	GND	108	PEX_TX4
109	PEX_RX3#	110	GND
111	PEX_RX3	112	PEX_TX3#
113	GND	114	PEX_TX3
115	PEX_RX2#	116	GND
117	PEX_RX2	118	PEX_TX2#
119	GND	120	PEX_TX2
121	PEX_RX1#	122	GND
123	PEX_RX1	124	PEX_TX1#
125	GND	126	PEX_TX1
127	PEX_RX0#	128	GND
129	PEX_RX0	130	PEX_TX0#
131	GND	132	PEX_TX0
133	PEX_REFCLK#	134	PRSNT1#
135	PEX_REFCLK	136	TV_C
137	CLK_REQ#	138	GND
139	PEX_RST#	140	TV_Y
141	RSVD	142	GND
143	RSVD	144	TV_CVBS
145	SMB_DAT	146	GND
147	SMB_CLK	148	VGA_RED
149	THERM#	150	GND
151	VGA_HSYNC	152	VGA_GRN
153	VGA_VSYNC	154	GND
155	DDCA_CLK	156	VGA_BLU
157	DDCA_DAT	158	GND
159	IGP_UCLK#	160	LVDS_UCLK#
161	IGP_UCLK	162	LVDS_UCLK
163	GND	164	GND
165	IGP_UTX3# / RSVD	166	LVDS_UTX3#
167	IGP_UTX3 / RSVD	168	LVDS_UTX3
169	RSVD	170	GND

FIG. 3A

Pin#	Signal Name	Pin#	Signal Name
171	IGP_UTX2#	172	LVDS_UTX2#
173	IGP_UTX2	174	LVDS_UTX2
175	GND	176	GND
177	IGP_UTX1#	178	LVDS_UTX1#
179	IGP_UTX1	180	LVDS_UTX1
181	GND	182	GND
183	IGP_UTX0#	184	LVDS_UTX0#
185	IGP_UTX0	186	LVDS_UTX0
187	GND	188	GND
189	IGP_LCLK# / DVI_B_CLK#	190	LVDS_LCLK#
191	IGP_LCLK / DVI_B_CLK	192	LVDS_LCLK
193	DVI_B_HPD / GND	194	GND
195	IGP_LTX3# / RSVD	196	LVDS_LTX3#
197	IGP_LTX3 / RSVD	198	LVDS_LTX3
199	GND	200	GND
201	IGP_LTX2# / DVI_B_TX2#	202	LVDS_LTX2#
203	IGP_LTX2 / DVI_B_TX2	204	LVDS_LTX2

Pin#	Signal Name	Pin#	Signal Name
205	GND	206	GND
207	IGP_LTX1# / DVI_B_TX1#	208	LVDS_LTX1#
209	IGP_LTX1 / DVI_B_TX1	210	LVDS_LTX1
211	GND	212	GND
213	IGP_LTX0# / DVI_B_TX0#	214	LVDS_LTX0#
215	IGP_LTX0 / DVI_B_TX0	216	LVDS_LTX0
217	DVI_A_HPD	218	GND
219	DVI_A_CLK#	220	DDCC_DAT
221	DVI_A_CLK	222	DDCC_CLK
223	GND	224	LVDS_PPEN
225	DVI_A_TX2#	226	LVDS_BL_BRGHT
227	DVI_A_TX2	228	LVDS_BLEN
229	GND	230	DDCB_DAT
231	DVI_A_TX1#	232	DDCB_CLK
233	DVI_A_TX1	234	2V5RUN
235	GND	236	GND
237	DVI_A_TX0#	238	3V3RUN
239	DVI_A_TX0	240	3V3RUN
241	GND	242	3V3RUN

FIG. 3B

Signal Name	Input/Output	Description
DVI_A_TX0-2, DVI_A_TX0-2#	Output, 100 Ohm Diff	TMDS output for either single link DVI or dual link DVI
DVI_A_CLK, DVI_A_CLK#	Output, 100 Ohm Diff	TMDS clock for either single link DVI or dual link DVI
DVI_A_HPD	Input	TMDS panel detect
DVI_B_TX0-2, DVI_B_TX0-2#	Output, 100 Ohm Diff	TMDS output for either single link DVI or dual link DVI, upper bits for dual-link: Note: these pins are shared with IGP LVDS loop through pins
DVI_B_CLK, DVI_B_CLK#	Output, 100 Ohm Diff	TMDS clock, only used for second single-link DVI. Note: these pins are shared with IGP LVDS loop through pins
DVI_B_HPD	Input/GND	TMDS panel detect, only used for second single-link DVI. Tie to GND on motherboard if notebook is configured for IGP LVDS pass through
DDCA_CLK	Output, 3.3 V logic levels	Serial link, can connect to VGA, DVI-A or DVI-B. Configuration needs to be stored in MXM system information ROM
DDCA_DAT	BI-Directional	Serial link, can connect to VGA, DVI-A or DVI-B. Configuration needs to be stored in MXM system information ROM
DDCB_CLK	Output, 3.3 V logic levels	Serial link, can connect to VGA, DVI-A or DVI-B. Configuration needs to be stored in MXM system information ROM
DDCB_DAT	BI-Directional	Serial link, can connect to VGA, DVI-A or DVI-B. Configuration needs to be stored in MXM system information ROM
LVDS_PPEN	Output, 3.3 V logic levels	LVDS Panel Power enable
LVDS_BLEN	Output, 3.3 V logic levels	LVDS Panel backlight enable
LVDS_BL_BRGHT	PWM Output	LVSD Panel brightness control, duty cycle determines output level
LVDS_UTX0-3, LVDS_UTX0-3#	Output, 100 Ohm Diff	LVDS output for dual link
IGP_UTX0-2, IGP_UTX0-2#	Input, 100 Ohm Diff	LVDS input that loops back to LVDS_UTX0-2, LVDS_UTX0-2# to provide path for LVDS with IGP only. Note: these pins are shared with DVI_B pins
LVDS_UCLK, LVDS_UCLK#	Output, 100 Ohm Diff	LVDS clock for dual link

FIG. 4A

Signal Name	Input/Output	Description
IGP_UCLK, IGP_UCLK#	Input, 100 Ohm Diff	LVDS input that loops back to LVDS_UCLK, LVDS_UCLK# to provide path for LVDS with IGP only. Note: these pins are shared with DVI_B pins
LVDS_LTX0-3, LVDS_LTX0-3#	Output, 100 Ohm Diff	LVDS output for either single link or dual link
IGP_LTX0-2, IGP_LTX0-2#	Input, 100 Ohm Diff	LVDS input that loops back to LVDS_LTX0-2, LVDS_LTX0-2# to provide path for LVDS with IGP only. Note: these pins are shared with DVI_B pins
LVDS_LCLK, LVDS_LCLK#	Output, 100 Ohm Diff	LVDS clock for either single link or dual link
IGP_LCLK, IGP_LCLK#	Input, 100 Ohm Diff	LVDS input that loops back to LVDS_LCLK, LVDS_LCLK# to provide path for LVDS with IGP only. Note: these pins are shared with DVI_B pins
TV_Y	Output, 37.5 Ohm +/- 2 Ohms	TV_OUT Chroma
TV_C	Output, 37.5 Ohm +/- 2 Ohms	TV_OUT Luma
TV_CVBS	Output, 37.5 Ohm +/- 2 Ohms	TV_OUT Composite
DDCC_CLK	Output, 3.3 V logic levels	Serial link, connect to EDID LVDS Panel and to MXM System Information ROM. This link is not to be used for external interfaces
DDCC_DAT	BI-Directional	Serial link, connect to EDID LVDS Panel and to MXM System Information Rom. This link is not to be used for external interfaces
VGA_BLU	Output, 37.5 Ohm +/- 2 Ohms	RGB Output
VGA_RED	Output, 37.5 Ohm +/- 2 Ohms	RGB Output
VGA_GRN	Output, 37.5 Ohm +/- 2 Ohms	RGB Output
VGA_HSYNC	Output, 75 Ohm, 3.3 V logic levels	RGB Horizontal Sync
VGA_VSYNC	Output, 75 Ohm, 3.3 V logic levels	RGB Vertical Sync
SMB_CLK	Input, 5 V tolerant	Serial link for thermal sensor on GPU. Connect to motherboard's SMBus Clock signal.
SMB_DAT	Bi-Dir, 5 V tolerant	Serial link for thermal sensor on GPU. Connect to motherboard's SMBus Data signal.
THERM#	Output, active low	Indicates a thermal alert. Connect to motherboard's SMBus Alert signal.
PRSNT1#	GND	Card present detect, indicates if MXM module is present. Tie to pull-up on motherboard. If high then MXM is not present. If low then MXM is present. Can be used to control IGP upgrade multiplexers

FIG. 4B

Signal Name	Input/Output	Description
PRSNT2#	GND	Tied to Ground on both motherboard and MXM. Reserved for future functionality.
CLK_REQ#	Output, active low	Indicates need for PEX_REFCLK
PEX_RST#	Input, active low	PCI_Express reset
PEX_REFCLK, PEX_REFCLK#	Input, 100 Ohm Diff	PCI-Express reference clock.
PEX_TX0-15, PEX_TX0-15#	Input, 100 Ohm Diff	PCI-Express 16 lanes, output from northbridge
PEX_RX0-15, PEX_RX0-15#	Output, 100 Ohm Diff	PCI-Express 16 lanes, input to northbridge
RUNPWROK	Input	Indicates that all power to the MXM is within the specified tolerances
3V3RUN	Power input	3.3 V run power
5VRUN	Power input	5 V run power
2V5RUN	Power input	2.5 V run power
1V8RUN	Power input	1.8 V run power
PWR_SRC	Power input	Battery power

FIG. 4C

Voltage Rail	Voltage	Current	Power	Notes
3V3RUN	3.3 V +/- 5%	1.5 Amps	4.95 W	3.3 V run
5VRUN	5 V +/- 5%	0.5 Amps	2.5 W	5 V run
2V5RUN	2.5 V +/- 5%	0.5 Amps	1.25 W	2.5 V run
1V8RUN	1.8 V +/- 5%	3.5 Amps	6.3 W	1.8 V run
PWR_SRC	7.5 V to 22 V	Up to 4 Amps	8.9 W to 38.9 W	Battery, store power capability in MXM system information ROM

FIG. 5

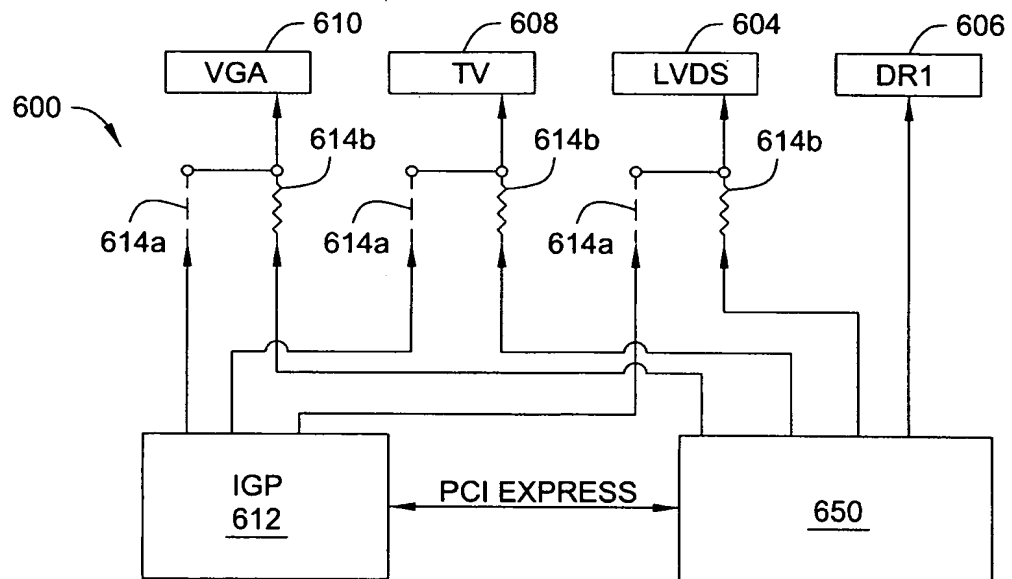


FIG. 6A

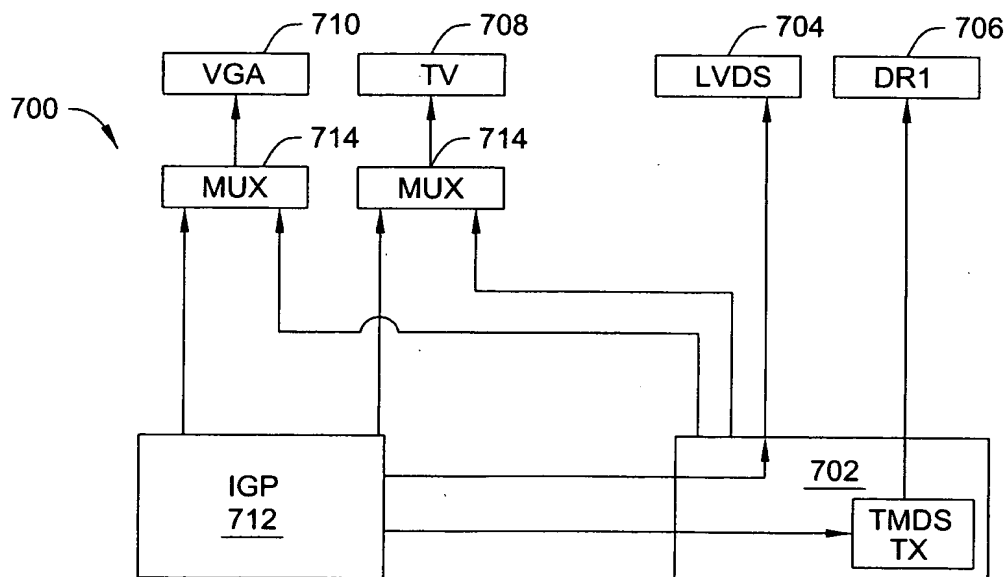


FIG. 7A

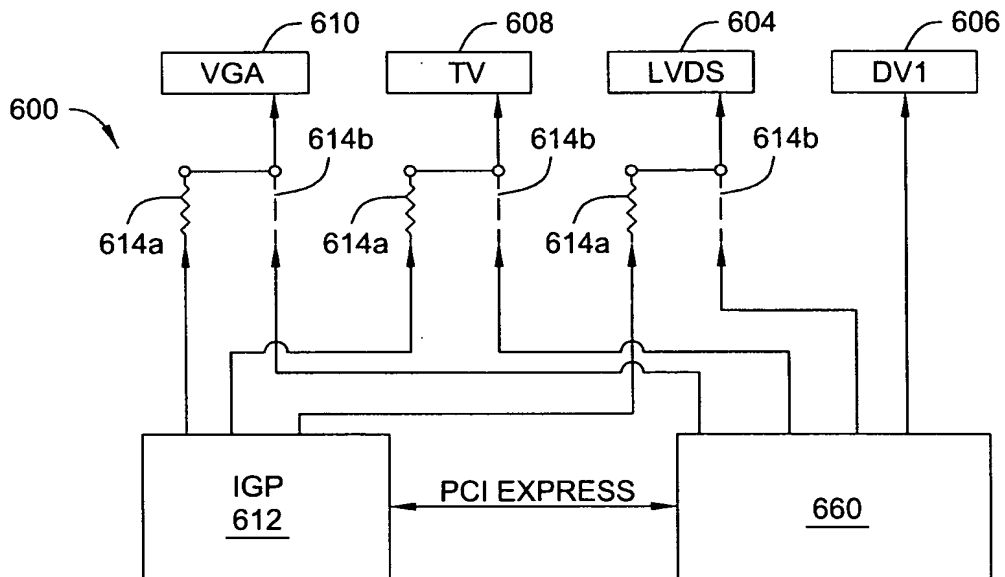


FIG. 6B

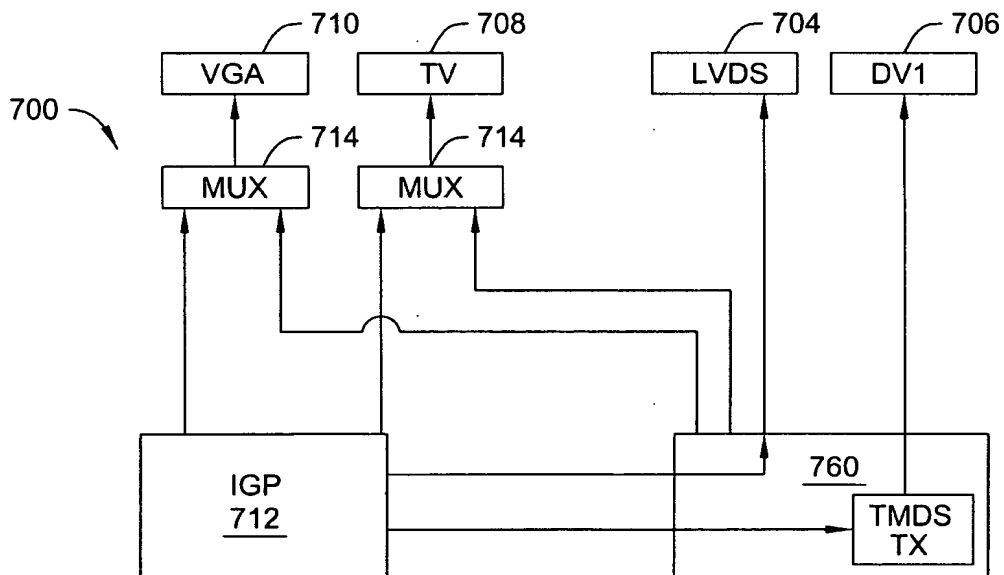


FIG. 7B